

BUCHSBAUMNESS IN LOCAL RINGS POSSESSING CONSTANT
FIRST HILBERT COEFFICIENTS OF PARAMETERS

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ABSTRACT. Let (A, \mathfrak{m}) be a Noetherian local ring with $d = \dim A \geq 2$. Then, if A is a Buchsbaum ring, the first Hilbert coefficients $e_Q^1(A)$ of A for parameter ideals Q are constant and equal to $\sum_{i=1}^{d-1} \binom{d-2}{i-1} h^i(A)$, where $h^i(A)$ denotes the length of the i -th local cohomology module $H_{\mathfrak{m}}^i(A)$ of A with respect to the maximal ideal \mathfrak{m} . This paper studies the question of whether the converse of the assertion holds true or not, and proves that A is a Buchsbaum ring, if A is unmixed and the values $e_Q^1(A)$ are constant which are independent of the choice of parameter ideals Q in A . Hence a conjecture raised by L. Ghezzi, S. Goto, J. Hong, K. Ozeki, T. T. Phuong, and W. V. Vasconcelos is settled affirmatively.

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